

REMARKS/ARGUMENTS

Claims 12, 13 and 16-21 are pending herein. Claims 12 and 13 have been amended hereby to clarify that the pores are defined by the silicon carbide particles and by a portion of the silicon nitride binder.* Applicants respectfully submit that support for rewritten claims 12 and 13 can be found in Fig. 1 of the present application, for example, as well as on page 5, lines 2-9 of the present specification, and that no new matter has been added.

Claims 12, 16, 18 and 20 were rejected under §102(b) over McArdle, and claims 13, 15, 17, 19 and 21 were rejected under §103(a) over McArdle in view of Kuramochi. Applicants respectfully traverse these rejections.

Independent claim 12 recites a porous material comprising silicon carbide particles as an aggregate and a silicon nitride binder bonding the silicon carbide particles so as to define pores present between the silicon carbide particles to provide an open porosity of 50% to 75%. The pores are defined by the silicon carbide particles and by a portion of the silicon nitride binder. A surface of the silicon nitride defining each pore is either free from any columnar silicon nitride, or includes columnar silicon nitride, provided that an amount of columnar silicon nitride having a thickness of more than 2 μm and an aspect ratio of less than 10 is greater than an amount of columnar silicon nitride having a thickness of 2 μm or less or an aspect ratio of 10 or more. Claims 16, 18 and 20 each depend from independent claim 12.

Independent claim 13 recites a porous material comprising, among other things, silicon carbide particles as an aggregate and a silicon nitride binder directly bonded with the silicon carbide particles and bonding the silicon carbide particles with one another so as to define pores between the silicon carbide particles. The pores are defined by the silicon carbide particles and by a portion of the silicon nitride binder,

* Since this feature was not recited in any of the dependent claims, the amendments to claims 12 and 13 clearly present new issues after Final Rejection. In an effort to expedite the prosecution of this application, Applicants are filing this Amendment with an RCE in lieu of filing an Amendment After Final Rejection that undoubtedly would not have been entered by the PTO.

and have a specific surface area of $1 \text{ m}^2/\text{g}$ or less, and an open porosity of the porous material is 40 to 75%. Claims 17, 19 and 21 each depend from independent claim 13.

Applicants respectfully submit that all claims pending herein define patentable subject matter over McArdle for at least the same reasons previously explained in the Amendments filed on December 18, 2007 and June 13, 2008, the entire remarks of which are incorporated herein, and for the additional reasons explained below.

In the July 2, 2008 Advisory Action, the PTO asserted that “the bonded abrasive product disclosed by McArdle is what the examiner considered equivalent to the applicants’ ‘porous material’ which is taught to be comprised of the silicon carbide particles bonded by a silicon nitride binder wherein the silicon nitride binder defines pores formed between the particles. Therefore, the pores between the bonded particles correspond to the pores of the overall article and as discussed in the action, the reference teaches a porosity (volume % of pores) within the abrasive product, therefore between the particles, that falls within the applicants’ ranges. As such, the reference’s abrasive product meets the porosity limitation of the applicants’ claims” (Advisory Action, continuation page, lines 4-9). Applicants respectfully submit, however, that the PTO is incorrect.

In the bonded abrasive product according to McArdle, the aggregate abrasive particles (which themselves consist of silicon carbide particles bonded together with silicon nitride) are bonded to one another to constitute the bonded abrasive material. One skilled in the art would clearly understand that the silicon carbide particles are effectively embedded in the binder phase 82, as shown in McArdle’s Fig. 1. The “voids” 86 present within any individual aggregate abrasive grain, shown in Fig. 1 of McArdle, are defined only by the ceramic binder material used to bond the silicon carbide particles to form the aggregate abrasive grains. It is also clear that the outer surface of each aggregate abrasive grain is defined only by the ceramic binder, which is also clear based on the structure shown in Fig. 1 of McArdle and the description in the specification of McArdle. That is, paragraph [0129] of McArdle explains that the binder “conforms closely to the outermost surfaces 88 of the solid particles,” which

increases the surface area of the aggregate particles so that the aggregates adhere strongly to one another in abrasive particles formed therefrom. Along those lines, Applicants respectfully submit that even when the aggregate abrasive grains of McArdle are bonded to one another to form McArdle's bonded abrasive product, any pores in the bonded abrasive product formed between the aggregate grains are defined only by the ceramic binder in which the silicon carbide particles of each grain are embedded and which surrounds the silicon carbide particles and defines the outer surface of each aggregate abrasive grain.

The pores between the bonded aggregate abrasive grains in McArdle's bonded abrasive product are simply not defined by silicon carbide particles and the silicon nitride binder in the claimed manner.

For at least the reasons explained above, Applicants respectfully submit that McArdle fails to disclose or suggest each and every feature recited in independent claims 12 and 13, and that Kuramochi does not overcome the deficiencies of McArdle. Accordingly, Applicants respectfully submit that independent claims 12 and 13, and all claims depending therefrom, define patentable subject matter over the applied references, and respectfully request that the above rejections be reconsidered and withdrawn.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

July 21, 2008

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